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the whole tree to become so. *Seventh*—The malady does not appear to spread in the grove, but may occur at several points simultaneously. The evidence of these facts points to a fungus origin for the disease.

REMEDIES.—The application of the following are recommended for trial as having fungicidal properties: *First*—A solution of bisulphide of potassium, ½ ounce to a gallon of water. *Second*—" Liquid grison," prepared by boiling 3 lbs. each of the flowers of sulphur and lime in 6 gallons of water until reduced to 2 gallons. When settled, pour off the clear liquid and bottle it for use. For use mix one part of this clear liquid in 12 gallons of water. *Third*—To 10 gallons of strong soap suds add about a pound of glycerine and one-half pint of carbolic acid.

These solutions should be applied in the form of a fine spray to the diseased trees. As intimated, what action they may have towards arresting the malady can only be determined by experiment.

Pinus monophylla and Pinus edulis.

In the BULLETIN for May, 1885, I published a note on my observations on *Pinus edulis* and *Pinus monophylla* in the far West. By these observations I was convinced that *Pinus monophylla* is but a variety of *P. edulis*, a variety confined to the more arid portions of the area it occupies; and I was led to consider *P. monophylla* as a desert plant, in which the leaves are consolidated to diminish their surface area; following the example of *Cactus*, *Holacantha*, *Canotia*, *Ephedra*, etc.

I am sorry to see from a note in the Gardeners' Chronicle of July 31st, that Sir Joseph Hooker does not accept my view of the case. He says, of my article, that "it reads well, but is not supported by facts." Now, with due respect to the great botanist whom we all delight to honor, I am compelled to appeal from his decision. If he could have had my experience, and had himself observed the facts from which I infer the specific identity of the two forms, I am quite sure he would accept the view I have advanced. It happens that I have spent two full years in the region occupied by the pines under consideration, and during that time I traversed nearly their entire habitat, viz., Nevada, Utah, Colorado, New Mexico, Arizona and Chihuahua. As botanist of the

Colorado and San Juan expeditions, my attention was naturally early drawn to trees which are the most conspicuous, and over large areas almost the only arborescent elements in the vegetation, and I have studied every phase of change from one variety into the other. In the Rocky Mountains all are two-leaved; in some arid portions of Nevada the tree is dwarfed to half its normal size and all the leaves are single. Midway between these districts, in southern Utah, may be found thousands of trees in which the leaves are half double, half single; and I would ask to which species these belong? It is not strange that to one examining *Pinus edulis* in Colorado, then going by rail to Nevada and there finding only *Pinus monophylla*, they should seem distinct; but to one who should travel by day marches from one district to the other, seeing the two forms gradually blending, I am sure they would be regarded only as geographical varieties.

I have called the Nevada form depauperate, a term to which Sir Joseph Hooker objects, because, as he says, the leaves are not dwarfed; but there are not half as many on the Nevada tree, which has generally shrunk to half the size of its eastern cousins, and in the dryest places it inhabits is barely more than a bush.

I may also add that Dr. Engelmann and Dr. Torrey were both satisfied of the specific identity of the two forms. This Dr. Torrey has put on record in his catalogue of the plants which I collected on the Colorado Expedition ("Report Upon the Colorado River of the West"), where, under the name "*Pinus edulis*, Engelm. (*P. Fremontiana*, Gord.)", which is said to be "common in all the higher portions of New Mexico," "*var. monophyllus*, Torr.," is recorded and referred to its habitat in the Cerbat Mountains, Arizona. In these circumstances it will perhaps not seem surprising that I adhere to my opinion that the two forms are but varieties of one species, and that the geographical distribution of these varieties illustrates in an interesting manner the influences which have produced the variation.

A peculiar confusion seems to exist in the minds of botanists in reference to the group of small nut-pines which inhabit our Western Territories and Northern Mexico, viz.: *P. cembroides*, Zucc.; *P. edulis*, Engelm.; *P. monophylla*, Torr. and Frem. (*P. Fremontiana*, Endl. not Gordon); and *P. Parryana*, Englm.

(*P. Llaveana*, Schiede and Deppe.) They are very much alike in habit, cones and flowers, but differ in the number of leaves; *P. Parryana* has three to five, generally four; *P. cembroides*, three, sometimes two; *P. edulis* two, and *P. monophylla* one or two. Dr. Engelmann suggests, what seems very reasonable, that they are all geographical varieties of one species.

I would refer those interested in the subject to Flora, 1832, Beib. ii., 93; Endlicher, Synopsis Coniferarum, pp. 192, 193; Gordon, Pinetum, pp. 265-274; Veitch, Manual of the Coniferæ, p. 160; Engelmann, Revision of the Genus *Pinus*, pp. 16-18.

J. S. NEWBERRY.

On the Species of the Genus Anychia, Richard.*

BY N. L. BRITTON.

In the course of my investigation of the flora of New Jersey I have been impressed by the difference in appearance and habitat of the two well known forms of *Anychia*—the one spreading, more or less pubescent, short jointed and small leaved, occurring mainly in open places, the other slender, erect, smooth, larger leaved and longer jointed, preferring dry woodlands, and have now reached the conclusion, after a critical examination of many specimens both in the field and the herbarium, that they are best regarded as distinct species. Under the generic name *Queria* they were early separated by Nuttall, (Genera, 158, 159,) who knew the pubescent, short jointed spreading form as *Q. Canadensis*, and the slender, smooth, erect one as *Q. capillacea*; I have examined a specimen of the latter named by himself. DeCandolle (Prodromus, iii., 369,) referring the plants to Michaux's genus *Anychia*, retained the two species as *A. dichotoma*, Michx., and *A. capillacea*, DC., though expressing some doubt as to their distinctness, and was in this followed by Beck (Bot., 131); this was again maintained by Mr. J. H. Redfield (Bull. Torr. Club, vi., 61, 62), and Bentham and Hooker in Genera Plantarum, iii., 17, regard the genus as consisting of two North American species. By all other authors, so far as I have been able to learn, the two have been considered as conspecific, or, regarding

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* Read before the Botanical Club of the A. A. A. S., Buffalo Meeting, August, 1886.